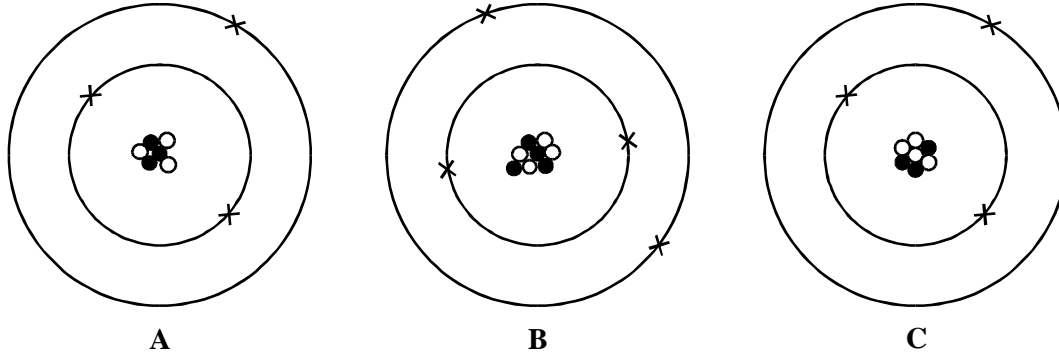


**Atomic structure**

1. The diagrams below represent three atoms, **A**, **B** and **C**.



(a) Two of these atoms are from the **same** element.

(i) Which of **A**, **B** and **C** is an atom of a different element? .....

(ii) Give **one** reason for your answer.

.....  
 .....  
 .....

(2)

(b) Two of these atoms are isotopes of the same element.

(i) Which **two** are isotopes of the same element? ..... and .....

(ii) Explain your answer.

.....  
 .....  
 .....

(3)

(c) Which of the particles **O**, **●** and **X**, shown in the diagrams:

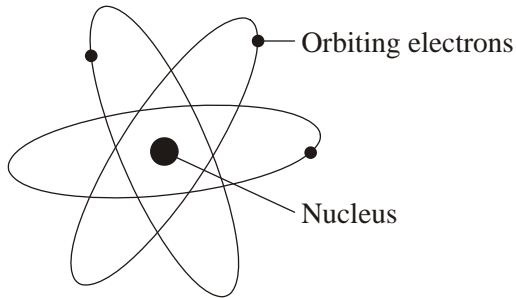
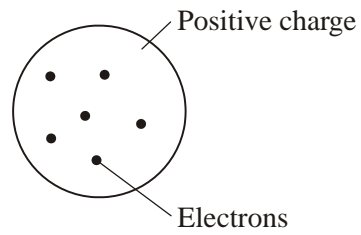
(i) has a positive charge; .....

(ii) has no charge; .....

(iii) has the smallest mass? .....

(3)

2. In the early part of the 20th century, scientists used the 'plum pudding' model to explain the structure of the atom.



Following work by Rutherford and Marsden, a new model of the atom, called the 'nuclear' model, was suggested.

(a) Describe the differences between the two models of the atom.

.....  
.....  
.....  
.....  
.....

(4)

(b) In their investigation, Rutherford and Marsden fired positively charged alpha particles at a very thin sheet of gold. Over a period of several months, the scientists made over 100 000 measurements. These measurements showed that:

- a very small number of alpha particles were deflected backwards from the gold foil.

Use the nuclear model to explain this experimental result.

.....  
.....  
.....

(2)

(c) Why did the work of Rutherford and Marsden convince many scientists that the 'plum pudding' model of the atom was incorrect?

.....  
.....  
.....

(2)

(Total 8 marks)